National Institute of Environmental Health Sciences

Cyclonic and anthropogenic influences on tern populations

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Abstract:

Organisms can be strongly affected by a range of natural and anthropogenic stressors in conjunction, making comprehensive assessments of multiple potential drivers of population dynamics essential. An 18-year dataset obtained for Michaelmas Cay in the northern Great Barrier Reef, Australia, was used to assess population trends for three tern species relative to two potential threatening processes, namely human impacts (as either commercial finishing or tourism) and cyclone activity. We found a positive, 2-year lagged relationship between long-line catch per unit effort in the Eastern Tuna and Billfish Fishery in the vicinity of Michaelmas Cay and breeding participation in the two pelagic foraging terns, but not in the inshore foraging tern. The abundance of large pelagic fish may influence recruitment into the breeding populations of the two pelagic terns in the following years through impacts on prey availability. Long-term population trends for all seabirds were not related to localised direct disturbance from cyclones or associated changes in cay size and/or nesting habitat. Current management protocols in place for the tourism industry at the cay appear to be minimising direct human impacts. Other evidence from this breeding location suggesting that climate variation may be driving foraging success and breeding-population dynamics in the two pelagic terns implies that a precautionary approach is warranted to the management of any potential stressors to birds in this system.

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Resource Description

Exposure :

weather or climate related pathway by which climate change affects health

Ecosystem Changes, Extreme Weather Event

Extreme Weather Event: Hurricanes/Cyclones, Landslides

Geographic Feature:

resource focuses on specific type of geography

Ocean/Coastal

Geographic Location:

resource focuses on specific location

Non-United States

Non-United States: Australasia

Health Impact: ☑

specification of health effect or disease related to climate change exposure

Health Outcome Unspecified

Resource Type: ☑

format or standard characteristic of resource

Research Article

Timescale: ☑

time period studied

Time Scale Unspecified